

CLAIMS

1. (amended) A process for production of an unsaturated fatty acid-containing oil, characterized by culturing a microorganism belonging to the genus *Mortierella* subgenus *Mortierella* in a medium containing a nitrogen source derived from defatted soybean or physically or chemically processed defatted soybean, and collecting the unsaturated fatty acid-containing oil from the cultured product.

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10 2. (amended) A process for production according to claim 1, characterized in that said nitrogen source derived from defatted soybean has a nitrogen content of at least 2 wt% with respect to the total components except for water.

15 3. (deleted)

4. (amended) A process for production according to claim 1 ~~or 2~~, characterized in that the processing of said defatted soybean is heat treatment; acid treatment; alkali treatment; enzyme treatment; chemical modification; denaturation and/or renaturation by chemical and/or physical processing including said treatment; removal of a portion of the components with water and/or organic solvents; removal of a portion of the components by filtration and/or centrifugation; freezing; crushing; drying; and/or sifting.

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25 5. (amended) A process for production according to claim 1 ~~or 2~~, characterized in that said nitrogen source derived from defatted soybean is from defatted soybean subjected at least to heat denaturation.

30 6. (amended) A process for production according to ~~any one of claims 1, 2, 4 and 5~~, characterized in that said cultured product is the culture broth taken during production of the oil by the cell culturing or after its sterilization, the culture broth obtained at the end of culturing or after its sterilization, or the cultured cells collected from either, alternatively in dry form.

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7. (amended) A process for production according to ~~any one of claims 1, 2 and 4 to 6~~, characterized in that the culturing of said microorganism is submerged culturing with aeration using a fermentor.

5 8. A process for production according to claim 7, characterized in that said fermentor is a fermentor equipped with an agitator and air sparger or an air-lift fermentor.

9. A process for production according to claim 7  
10 ~~or 8~~, characterized in that the culturing is carried out while maintaining a glucose concentration of at least 0.3 wt% and/or an average glucose concentration of at least 0.5 wt%, for at least 3 days after the start of culturing.

15 10. A process for production according to ~~any one of claims 7 to 9~~, characterized in that the culturing is carried out for a period of 2 to 20 days.

20 11. (amended) A process for production according to any one of claims 1, 2 and 4 to 10, characterized in that said unsaturated fatty acid is  $\gamma$ -linolenic acid, dihomo- $\gamma$ -linolenic acid, arachidonic acid, eicosapentaenoic acid and/or Mead acid.

12. (deleted)

25 *Sulf* 13. (amended) An arachidonic acid-containing oil characterized by having a 24,25-methylencholest-5-en-3 $\beta$ -ol compositional ratio in a proportion of ~~0.14~~ or less with respect to the desmosterol compositional ratio, and an arachidonic acid content of 18 to 54%.

30 14. (amended) An arachidonic acid-containing oil characterized by having a 24,25-methylencholest-5-en-3 $\beta$ -ol compositional ratio of 35% or lower, a 24,25-methylencholest-5-en-3 $\beta$ -ol compositional ratio in a proportion of ~~0.14~~ or less with respect to the desmosterol compositional ratio, and an arachidonic acid content of 18 to 54%.

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15. (amended) An arachidonic acid-containing oil according to claim 13 ~~or 14~~, characterized by being a microbial oil obtained from a microorganism belonging to the genus *Mortierella* subgenus *Mortierella*.

5 16. (amended) A nutritive dietary supplement comprising an arachidonic acid-containing oil according to ~~any one of claims 13 to 15~~.

10 17. (amended) An immature infant formula, infant formula, baby food or pregnancy food product comprising an arachidonic acid-containing oil according to ~~any one of claims 13 to 15~~.

15 18. (amended) An animal feed comprising an arachidonic acid-containing oil according to ~~any one of claims 13 to 15~~.

20 19. (added) A process for production of an unsaturated fatty acid-containing oil, characterized by culturing with aeration a microorganism belonging to the genus *Mortierella* subgenus *Mortierella* in a liquid medium containing a nitrogen source derived from soybean in a fermenter, and the unsaturated fatty acid-containing oil is collected from the cultured product.

25 20. (added) A process for production according to claim 19, characterized in that said nitrogen source derived from soybean has a nitrogen content of at least 2 wt% with respect to the total components except for water.

30 21. (added) A process for production according to claim 19 ~~or 20~~, characterized in that said nitrogen source derived from soybean is at least one selected from the group consisting of defatted soybean, non-defatted soybean and their processed products.

35 22. (added) A process for production according to claim 21, characterized in that the processing of said defatted soybean or non-defatted soybean is heat treatment; acid treatment; alkali treatment; enzyme treatment; chemical modification; denaturation and/or renaturation by chemical and/or physical processing

including said treatment; removal of a portion of the components with water and/or organic solvents; removal of a portion of the components by filtration and/or centrifugation; freezing; crushing; drying; and/or sifting.

5 23. (added) A process for production according to claim 19 ~~or 20~~, characterized in that said nitrogen source derived from soybean is from defatted soybean subjected at least to heat denaturation.

10 24. (added) A process for production according to ~~any one of claims 19 to 23~~, characterized in that said cultured product is the culture broth taken during production of the oil by the cell culturing or after its sterilization, the culture broth obtained at the end of culturing or after its sterilization, or the cultured cells collected from either, alternatively in dry form.

15 25. (added) A process for production according to ~~any one of claims 19 to 24~~, characterized in that said fermentor is a fermentor equipped with agitator and air sparger or an air-lift fermentor.

20 26. (added) A process for production according to ~~any one of claims 19 to 25~~, characterized in that the culturing is carried out while maintaining a glucose concentration of at least 0.3 wt% and/or an average glucose concentration of at least 0.5 wt%, for at least 3 days after the start of culturing.

25 27. (added) A process for production according to ~~any one of claims 19 to 26~~, characterized in that the culturing is carried out for a period of 2 to 20 days.

30 28. (added) A process for production according to ~~any one of claims 19 to 27~~, characterized in that said unsaturated fatty acid is  $\gamma$ -linolenic acid, dihomo- $\gamma$ -linolenic acid, arachidonic acid, eicosapentaenoic acid and/or Mead acid.

35 *Sub C3* 29. (added) A nutritive dietary supplement comprising an arachidonic acid-containing oil characterized by having a 24/25-methylenecholest-5-en-3 $\beta$ -ol compositional ratio of 35% or lower and an arachidonic

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*Sub C3*

acid content of 18 to 54%; an arachidonic acid-containing oil characterized by having a 24,25-methylencholest-5-en-3 $\beta$ -ol compositional ratio in a proportion of 1.2 or less with respect to the desmosterol compositional ratio and an arachidonic acid content of 18-54%; or an arachidonic acid-containing oil characterized by having a 24,25-methylencholest-5-en-3 $\beta$ -ol compositional ratio of 35% or lower, a 24,25-methylencholest-5-en-3 $\beta$ -ol compositional ratio in a proportion of 1.2 or less with respect to the desmosterol compositional ratio, and an arachidonic acid content of 18 to 54%.

*Sub D2*

10 30. (added) An immature infant formula, infant formula, baby food or pregnancy food product comprising an arachidonic acid-containing oil according to claim 29.

15 31. (added) An animal feed comprising an arachidonic acid-containing oil according to claim 29.

*Sub D4*